

(PCT Article 36 and Rule 70)

Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/JP	Authorized officer
Facsimile No.	Telephone No.

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2005/002529

## Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of:
- ☐ international search (Rule 12.3 and 23.1(b))
- ☐ publication of the international application (Rule 12.4)
- ☐ international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:
- ☐ the international application as originally filed/furnished
- ☒ the description:
- pages 1-3, 5-6, 8-72 as originally filed/furnished
- pages\* 4, 7-7/1 received by this Authority on 14.09.2005
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the claims:
- nos. 2-5, 7-10, 12-16, 18-21 as originally filed/furnished
- nos.\* \_\_\_\_\_ as amended (together with any statement) under Article 19
- nos.\* 1, 6, 11, 17 received by this Authority on 14.09.2005
- nos.\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ the drawings:
- sheets \_\_\_\_\_ as originally filed/furnished
- sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

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Box No. IV

Lack of unity of invention

1. ☐ In response to the invitation to restrict or pay additional fees the applicant has:
- ☐ restricted the claims.
  - ☐ paid additional fees.
  - ☐ paid additional fees under protest.
  - ☐ neither restricted the claims nor paid additional fees.
2. ☒ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is:
- ☐ complied with.
  - ☒ not complied with for the following reasons:

The feature that is common to the inventions set forth in 1 to 5, the inventions set forth in claims 6 to 10, the inventions set forth in claims 11 to 16, and the inventions set forth in claims 17 to 21 is the method for producing aromatic compounds by reacting one of the halogen compounds or sulfonate compounds that are set forth in the present application with an aromatic metal compound in the presence of an iron catalyst and a diamine compound; however, said method is well known, as disclosed in documents A and B indicated below. Such being the case, the method in question does not define a contribution over the prior art, and thus does not constitute a special technical feature as stipulated in Rule 13.2 of the Regulations Under the PCT.

[Refer to the Supplemental Box]

4. Consequently, this report has been established in respect of the following parts of the international application:

☒ all parts.

☐ the parts relating to claims Nos. \_\_\_\_\_

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Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement		
1.	Statement		
	Novelty (N)	Claims <u>6-21</u>	YES
		Claims <u>1-5</u>	NO
	Inventive step (IS)	Claims <u>11-21</u>	YES
		Claims <u>1-10</u>	NO
	Industrial applicability (IA)	Claims <u>1-21</u>	YES
		Claims _____	NO
2.	Citations and explanations (Rule 70.7)		
	Document 1: JP 2000-229243 A (Tosoh Corp.), 22 August 2000		
	Document 2: US 2003/0220498 A1 (FURSTNER et al.), 27 November 2003		
	Document 3: JP 2001-293375 A (Tosoh Corp.), 23 October 2001		
	Document 4: JP 2000-344727 A (Tosoh Corp.), 12 December 2000		
	Documents 1 to 4 are cited in the international search report.		
	A.		
	The inventions set forth in claims 1 to 5 lack novelty and do not involve an inventive step in the light of documents 1 to 2.		
	Documents 1 to 2 disclose methods for producing aromatic compounds by reacting one of the halogen compounds or sulfonate compounds that are set forth in the present application with an aromatic magnesium compound in the presence of an iron catalyst and a diamine compound.		

Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
B.	<p>The inventions set forth in claims 6 to 10 do not involve an inventive step in the light of documents 1 to 4.</p> <p>Documents 1 to 2 disclose methods for producing aromatic compounds by reacting one of the halogen compounds or sulfonate compounds that are set forth in the present application with an aromatic zinc compound in the presence of an iron catalyst and a diamine compound.</p> <p>Meanwhile, documents 3 to 4 disclose methods for producing aromatic zinc compounds by reacting one of the aromatic magnesium compounds that are set forth in the present application with a zinc compound in the presence of a diamine compound. Such being the case, it cannot be considered to be difficult for a person skilled in the art to conceive of employing the method in question in order to produce the aromatic zinc compounds that are disclosed in documents 1 to 2.</p> <p>C.</p> <p>The inventions set forth in claims 11 to 16 are novel and involve an inventive step in relation to documents 1 to 4.</p> <p>That is to say, the method for producing aromatic compounds via a step for reacting one of the aromatic lithium compounds that are set forth in the present application with a zinc compound in the presence of a diamine compound in order to obtain a reaction mixture and a step for reacting one of the halogen compounds or sulfonate compounds that are set forth in the present application with the aforementioned reaction mixture in the presence of an iron catalyst, wherein the</p>

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Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

aforementioned reaction mixture that comprises a zinc compound and an aromatic lithium compound is subsequently reacted with one of the Lewis acid metal compounds that are set forth in the present application, is not disclosed in any of documents 1 to 4, and would not have been obvious to a person skilled in the art.

D.

The inventions set forth in claims 17 to 21 are novel and involve an inventive step in relation to documents 1 to 4.

The method for producing aromatic compounds by reacting one of the halogen compounds or sulfonate compounds that are set forth in the present application with an aromatic zinc compound in the presence of an iron catalyst and a diamine compound, wherein the aforementioned aromatic zinc compound is reacted with one of the magnesium compounds that are set forth in the present application, is not disclosed in any of documents 1 to 4, and would not have been obvious to a person skilled in the art.

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## Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:

The Cover Sheet

International Patent Classification (IPC) or national  
classification and IPC

C07C15/107 (2006.01), C07C15/12 (2006.01), C07C17/263  
(2006.01), C07C22/08 (2006.01), C07C41/30 (2006.01),  
C07C43/21 (2006.01), C07C67/293 (2006.01), C07C67/343  
(2006.01), C07C69/157 (2006.01), C07C69/24 (2006.01),  
C07C69/612 (2006.01), C07C69/76 (2006.01), C07C253/30  
(2006.01), C07C255/37 (2006.01), C07C255/41 (2006.01),  
C07C255/50 (2006.01), C07D209/08 (2006.01), C07D211/34  
(2006.01), C07D213/127 (2006.01), C07D213/16 (2006.01),  
C07D307/20 (2006.01), C07D407/06 (2006.01), C07F7/08  
(2006.01), C07J9/00 (2006.01), B01J31/20 (2006.01),  
B01J31/22 (2006.01), B01J31/30 (2006.01), C07B61/00  
(2006.01)

## Supplemental Box

## Box IV.3

As a result, there is no technical relationship involving one or more of the same or corresponding special technical features among the abovementioned four groups of inventions; consequently, the present international application sets forth four groups of inventions that are not linked so as to form a single general inventive concept.

Document A: JP 2000-229243 A (Tosoh Corp.), 22 August 2000

Document B: US 2003/0220498 A1 (FURSTNER et al.), 27 November 2003